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SANYO

DC6005NL
DC6105NL (EUROPE)

DATA DISPLAY MONITOR CHASSIS

TECHNICAL MANUAL

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SAFETY PRECAUTION

WARNING : Service should not be attempted by anyone unfamiliar with the necessary precautions on this unit.
The following precautions are necessary during servicing.

1. Some parts such as a picture tube in this monitor have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, the parts replacement should be undertaken referring to item 2 below.

2. Many electrical and mechanical parts in this unit have special safety-related characteristics for protection against shock hazard, fire hazard and others. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements marked with a ⚠ on the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully.

3. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as; insulating cover, barries, strain relief, etc.

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GENERAL DESCRIPTION

Models DC6005NL/DC6105NL are 5.5 inch raster scan display monitors designed specifically for data terminals. These models are designed for high quality displays of the alphanumeric dot characters. DC6005NL/DC6105NL accept video, horizontal drive and vertical drive as separate TTL level signals. The 100% solid state silicon circuitry provides cool operation and high reliability.

Features

- 5.5 inch CRT
- Direct etched non-glare faceplate (option)
- 650 lines horizontal resolution
- Horizontal Video Center Control
- Compact chassis type for easy mounting

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SPECIFICATIONS

Mechanical (approx.)

Chassis Dimension	130 mm (W) x 113 mm (H) x 219 mm (D)
Weight	
Net Weight	1.2 Kg.

Picture tube

Size & deflection	5.5 inch, 20.0 mm dia. neck, 70° deflection.
Faceplate	360 mm radius, direct etched non-glare faceplate.
Phosphor	P4 (White) Model: DC6005NL P31 (Green) Model: DC6105NL
Type	E2765B4 (LG)-HT Model: DC6005NL E2765B31 (LG) or C5M113P31 Model: DC6105NL E2765B31 (LG)-HT Model: DC6105NL

Controls

Width	Coiled type mounted on PCB
Horiz. Video-center	Rotary VR type mounted on PCB
Height	Rotary VR type mounted on PCB
Vert. Linearity	Rotary VR type mounted on PCB
Vert. Hold	Rotary VR type mounted on PCB
Horiz. Linearity	Coiled type mounted on PCB
Focus	Rotary VR type mounted on PCB
Sub-Brightness	Rotary VR type mounted on PCB
Contrast	Rotary VR type mounted on Main PCB (Optional)
Brightness	External, user supply
Raster centering	Raster centering rings (magnet type) mounted on Deflection Yoke

Input Connector . . . . . 10 pin cardedge board connector. (refer to attached Input Signal Interface)

Performance

Horiz. Resolution	
Center	650 lines, nominal.
Corner	500 lines, nominal.
Video Bandwidth	12 MHz, nominal. (−3 dB)
Geometric Distortion	±2.5 %, nominal ±3.0 %, maximum.
Non-Linearity	
Vertical	7 %, nominal. 10 %, maximum.
Horizontal	10 %, nominal 13 %, maximum

Display Area (Picture centering and tilt specified in Fig. 1 & 2 are Sanyo's timing.)

*Horizontal	92±5 mm
*Vertical	70±5 mm

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Electrical

Input Signal

Video signal	4±1.5 Vpp thru 500 ohm contrast control VR, positive going white.
Horizontal drive	4±1.5 Vpp 5K ohms, positive going.
Vertical drive	4±1.5 Vpp 15K ohms, negative going.
**Horizontal rate	15.25 KHz min. – 16.6 KHz max.
**Vertical rate	49 to 61 Hz

Retrace time (nominal)

Horizontal	7.0 uS
Vertical	850 uS
Power Requirement	DC 12V ±0.1V, regulated, 0.8A nominal 1.0A maximum Ripple 10 mVpp maximum

Environmental

Temperature

Operation	0°C to 55°C
Storage	–20°C to 70°C

Humidity

Operation	10 % to 80 %, non-condensing
Storage	10 % to 80 %, non-condensing
Altitude	Up to 10,000 ft (3,050 m)

X-ray radiation . . . . . Less than 0.5 mR/H

MTBF . . . . . 30,000 hours, without CRT

Factory adjusted rate

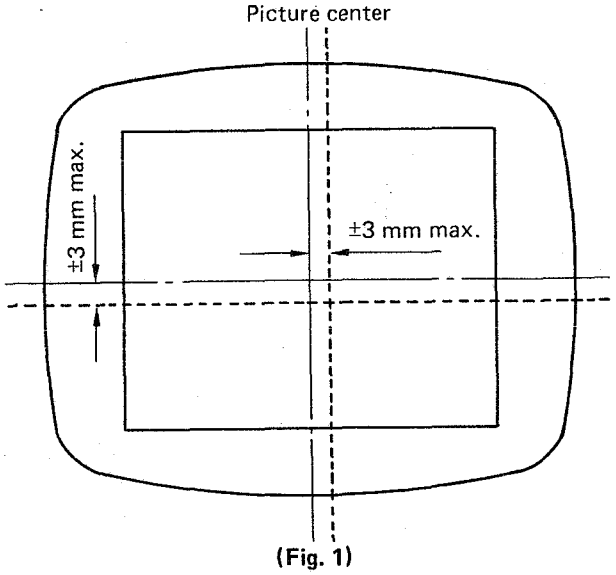
Power Source	DC 12±0.1 V, regulated

Scanning Frequency (depend on timing chart)

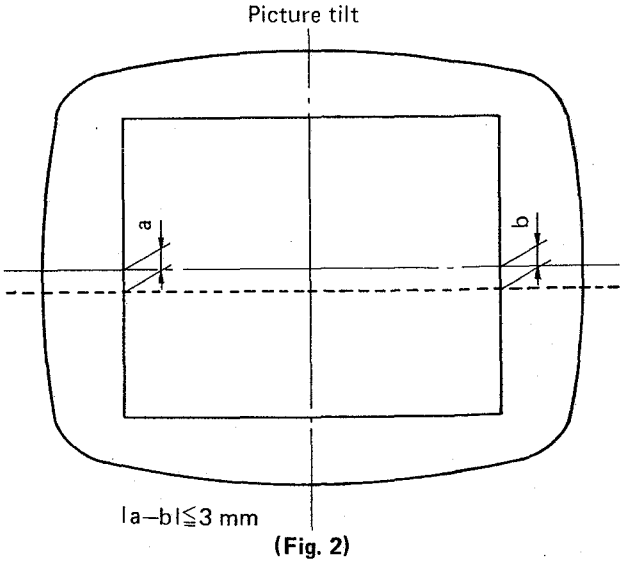
Vertical	60 Hz
Horizontal	16.6 KHz
Brightness	Raster cutoff

NOTE: Items with "*" marks in this specifications indicate the Factory Adjusted Rates.
Items with "**" marks indicate Factory Timing. (Refer to Page 7)
Input Signal Format is specified on Page 8.

Picture centering & tilt



(Fig. 1)



(Fig. 2)

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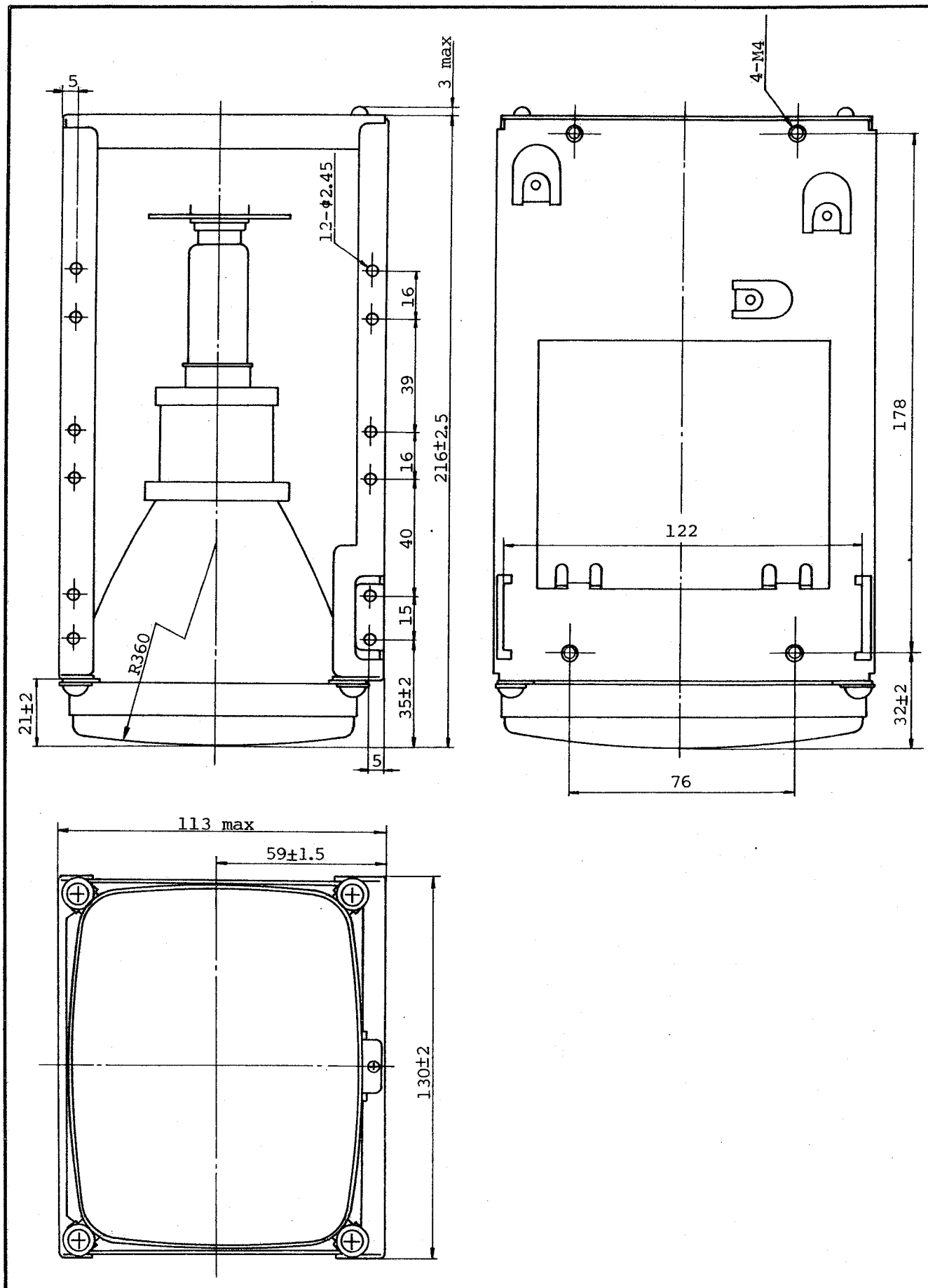

Unit: mm

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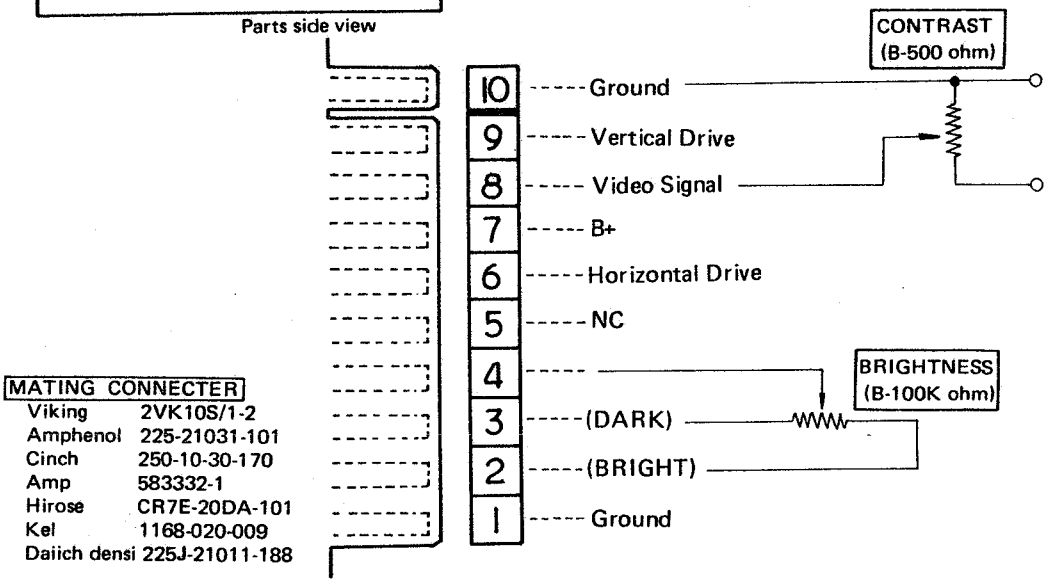
PIN CONNECTION



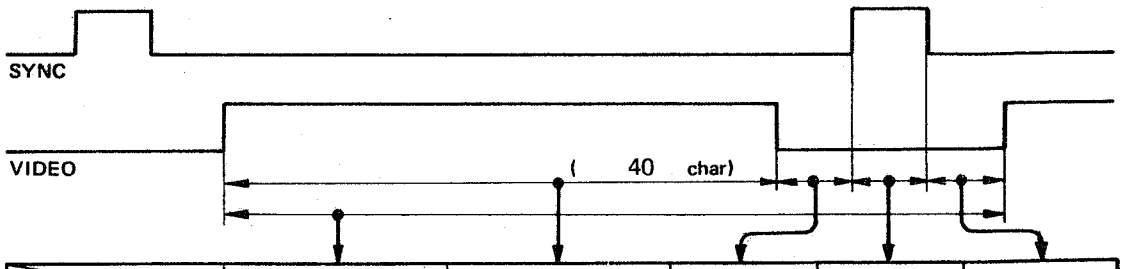
MATING CONNECTER

Viking	2VK10S/1-2
Amphenol	225-21031-101
Cinch	250-10-30-170
Amp	583332-1
Hirose	CR7E-20DA-101
Kel	1168-020-009
Daiich densi	225J-21011-188

CHARACTER INFORMATION

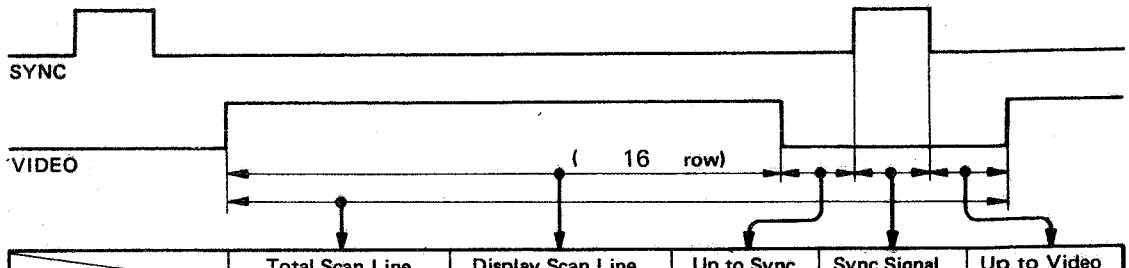
CHARACTER	5 x 7 dots	DOT CLOCK	6.5116 MHz
CHARACTER BLOCK	7 x 14 dots	CHARACTER CLOCK	0.9302 MHz

HORIZONTAL TIMING



	Total Character	Display Character	Front Porch	Sync Signal	Back Porch
Horizontal Rate	56 Char	40 Char	2 Char	10 Char	4 Char
16.6 kHz	60.2 uS	43 uS	2.15 uS	10.75 uS	4.3 uS

VERTICAL TIMING



	Total Scan Line	Display Scan Line	Up to Sync	Sync Signal	Up to Video
Vertical Rate	266 Line	224 Line	14 Line	3 Line	25 Line
50 Hz	19.4 mS	13.5 mS	2.53 mS	0.18 mS	3.19 mS

Card No.-15

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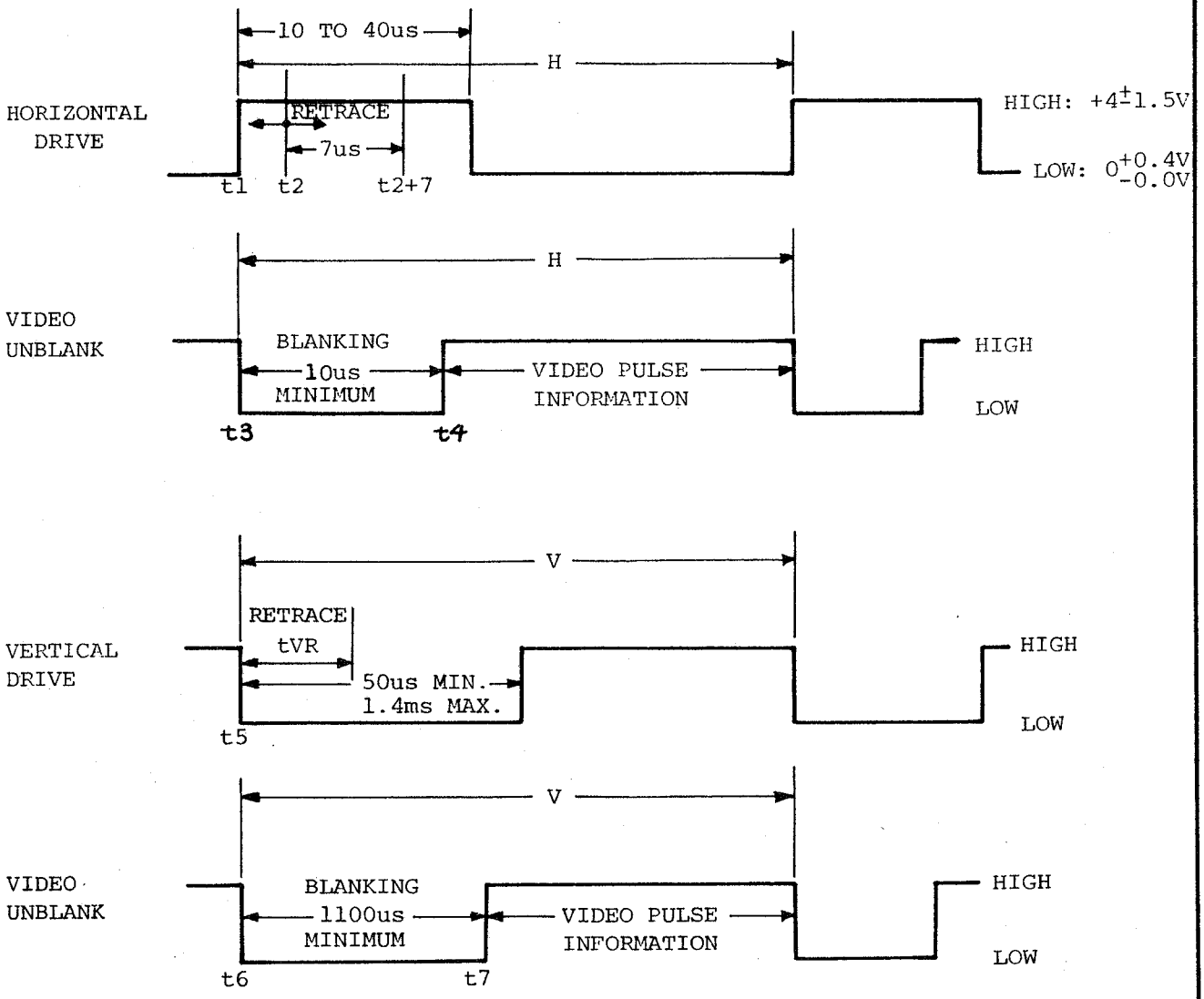

NOTES; 1. HORIZONTAL RETRACE IS INITIATED AT t2 (1.5 TO 6.5μs AFTER t1, DEPENDING ON SETTING OF VR601)
2. H=PERIOD OF ONE LINE: 65.57μs MIN. TO 60.24μs MAX.
3. VERTICAL RETRACE IS INITIATED AT t5 WITHOUT DELAY.
4. V=PERIOD OF ONE FIELD: 16.4ms MIN. TO 20.4ms MAX.

TABLE 1. t3 VS t1 TIMING FOR CENTERED HORIZONTAL VIDEO AS FUNCTION OF H. BLANKING WIDTH.

HORIZONTAL VIDEO BLANKING	
WIDTH t4 - t3	LEAD / LAG t1 - t3
10	-5.0 TO 0μs
12	-4.0 TO 1.0μs
14	-3.0 TO 2.0μs
16	-2.0 TO 3.0μs
18	-1.0 TO 4.0μs
20	-0 TO 5.0μs

TABLE 2. t6 VS t5 TIMING FOR CENTERED VERTICAL VIDEO AS FUNCTION OF V. BLANKING WIDTH.

VERTICAL VIDEO BLANKING	
WIDTH t7 - t6	LEAD / LAG t5 - t6
1100	125μs
1150	150μs
1250	200μs
1450	300μs
1650	400μs

VERTICAL RETRACE TIME tVR=850us

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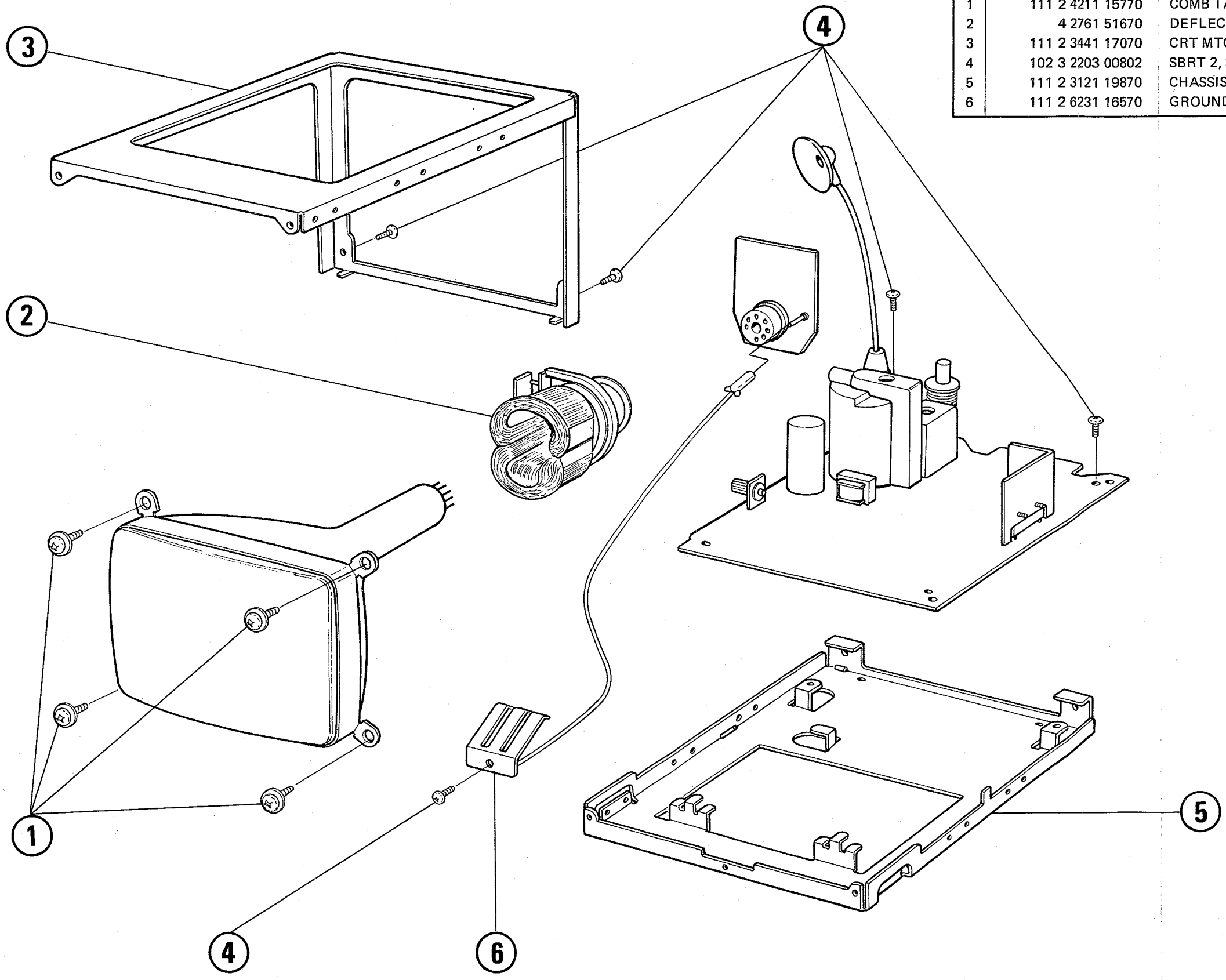
EXPLODED VIEW

NO.	PART CODE	DESCRIPTIONS	Q'TY
1	111 2 4211 15770	COMB TAP SCREW-MBW	1
2	4 2761 51670	DEFLECTION YOKE	1
3	111 2 3441 17070	CRT MTG BRKT-MDK	1
4	102 3 2203 00802	SBRT 2, 3.0x8 Z1	5
5	111 2 3121 19870	CHASSIS FRAME-MDK	1
6	111 2 6231 16570	GROUNDING TIP-MDK	1



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CONTROLS on PCB

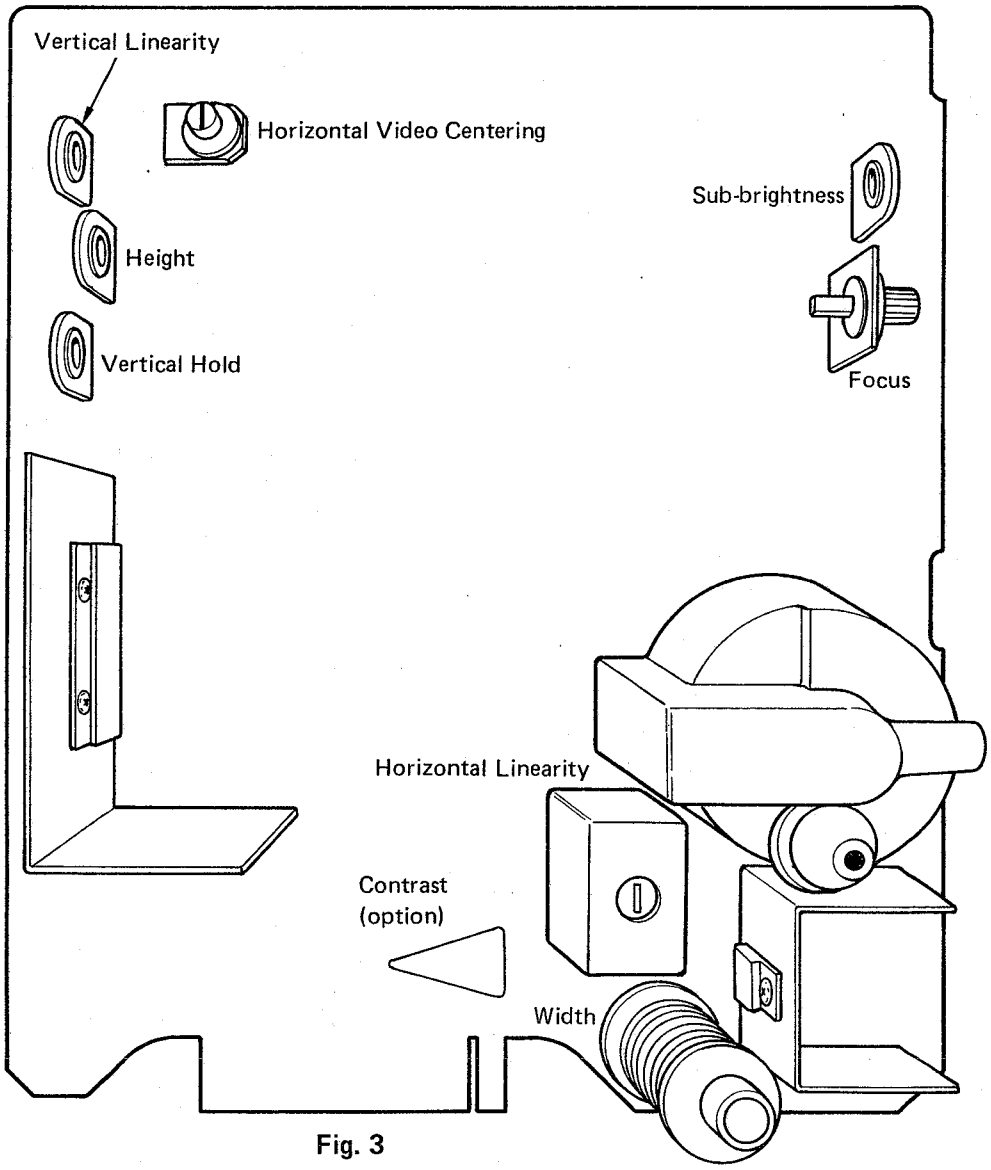

Fig. 3

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INSTALLATION

3-1. Safety Warning

1) Extreme care should be taken in handling the cathode ray tube as rough handling may cause it to implode. Any undue external pressure on glass, especially on the thin neck portion, should be avoided.
2) In case of CRT replacement, be sure to use the tube of the samy type number as specified. The use of the cathode ray tube type other than the specified may cause possible increase of X-ray radiation.

3-2. Mounting

A. It is recommended that all the Disk Portion is covered by silicon steel. In addition, it is an effective method to isolate between the Disk Portion and the FBT of the CRT Display Monitor by silicon steel. Special care should be taken when the Disk Portion is located on the right side.

B. Any power transformer, power unit or switching regulator should be located well apart from CRT, Deflection Yoke, and the printed circuit board (especially the vertical and horizontal circuit) as the external flux field or noise may cause mal-effect on displayed picture stability.

3-3. Power Input

The DC input power is applied through Pin 7 (B+) and Pin 1 (Ground) of 10-pin cardedge board connector.

CAUTION: A. As the picture size varies according to the variation of the voltage (Reference voltage: 12 V DC), the variation of ±0.1 or less is desirable.

B. The use of power source with many ripples may cause mal-effect on displayed picture stablility. The ripple of 10 mVpp or less is desirable.

3-4. Data Signal Input

Apply data signal to each pin of 10-pin cardedge board connector. (Refer to Input Signal Interface.)

CAUTION: If the amplitude of the video signal is 2.0 Vpp (nominal) or more, use the contrast control (B-500 ohm VR) for gain adjustment. Otherwise, the displayed picture will be out of focus because the video amplifier is saturated.

Some models are equipped with the contrast control on the p.c.b. Call the dealer for the details.

3-5. Controls

1) The following controls are factory adjusted for the optimum, and user's readjustments are not required.

Controls	PCB Marking	Location
Focus	FOCUS	VR652
Width		L602
Vertical Linearity	V-LIN	VR503
Horizontal Linearity		L601
Height	V-HEIGHT	VR502
Centering		DY

2) Under listed controls may be readjusted if necessary, though standard adjustments have been made on all controls in factory.

Controls	PCB Marking	Location
Contrast	CONT	VR201 If equipped with.
Brightness	SUB-BRIGHT	VR651
Horizontal video center	VIDEO CENTER	VR601
Vertical hold	V-HOLD	VR501

Note: 1. All controls are located on main PCB.
2. SUB BRIGHT can be used as main brightness control if no connection is made to external brightness control.

3) External Brightness and Contrast Control Connection
If necessary, an external brightness control (B-100K OHM) and external contrast control (B-500 OHM) can be used under the following method with 10 pin cardedge board connector.
Refer to INPUT SIGNAL INTERFACE.

Note: If the contrast control is used, check the items below.
1. Contrast control is not equipped with the unit, use EXTERNAL CONTRAST CONTROL as the Input Signal Interface.
2. Contrast control is equipped with the main PCB (VR201).
   1) Remove the VR 201 from main PCB.
   2) Remove Signal Cable (coaxial cable) from Point-SI11 on main PCB.
   3) Then connect Signal Cable (coaxial cable) to Point-SI1 (Slider of control VR) of main PCB.
   4) Use EXTERNAL CONTRAST CONTROL as the Input Signal Interface.

OPERATION

4. Operation

4-1. Apply power and signals (Video, Vert-drive and Horiz-drive) as specified, and check the display synchronization.

4-2. Brightness Adjustment
Set external brightness (if connected) and contrast control (equipped with the unit or external) to its maximum, and adjust sub-brightness control for visual cutoff raster.

4-3. Contrast Adjustment
With brightness, set to visual raster cutoff, adjust the contrast control at the point where defocusing disappers when the control is turned down from its maximum.

Note:
Refer to ADJUSTMENT on page 14.

CAUTION FOR SERVICING

5. Caution

Before remove CRT, discharge the HIGH VOLTAGE throughly with the following procedures step 1 to 5. (Refer to Fig. 4)

WARNING: Great care must be taken because the High Voltage will be charged for approximately 30 hours or more after power is turned off. Dischage the High Voltage before assembling each of the units or servicing.

Procedures

Step 1. Remove the CRT Socket P.C.Board from CRT.
Step 2. Remove CRT Grounding Wire from CRT Socket P.C.Board.
Step 3. Discharge the High Voltage which has been charged in CRT. (See Fig. 4)
Step 4. Remove Anode Cap.

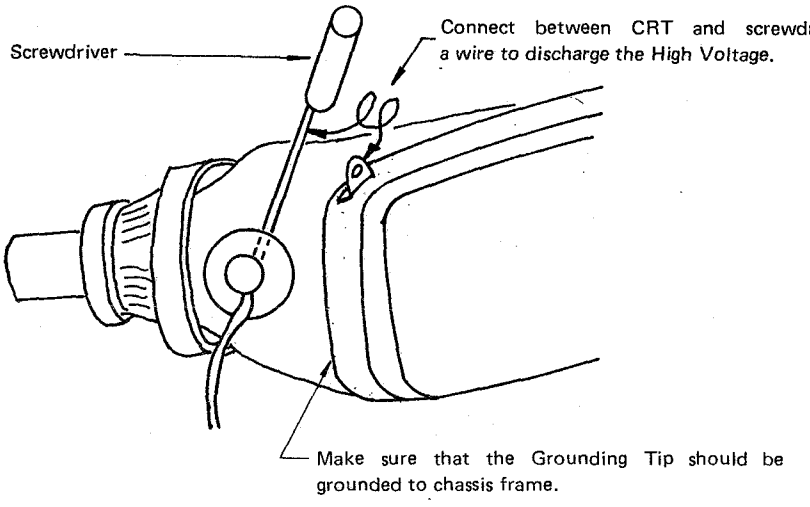
Screwdriver
Connect between CRT and screwdriver with a wire to discharge the High Voltage.
Make sure that the Grounding Tip should be grounded to chassis frame.

Fig. 4 Discharge of High Voltage

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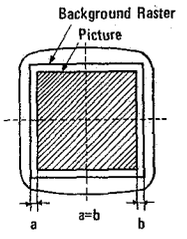
ADJUSTMENT

1. PREPARATION Make sure preparatory adjustment is made before proceeding the adjustment procedure.
   1.1 DC INPUT VOLTAGE ..... Set specified DC input voltage. (12±0.1 V)
   1.2 TEST SIGNAL ..... Specified signal input voltage and timing. Character "H" should be displayed on the whole screen.
   1.3 PICTURE SYNCHRONIZATION ..... Synchronize the picture with V-Hold VR (VR501) for vertical.
2. ADJUSTMENT PROCEDURE (1. Refer to parts location diagram for points to be adjusted. 2. After servicing, make sure all the screws loosened for adjustment are re-tightened.)

	Item	Setting Value	Point to be Adjusted	Adjustment
2.1	Horizontal Video Centering		VIDEO CENTER (VR601)	(1) Set External Brightness or sub-bright VR (VR651) to where background raster slightly appears. (2) Adjust Horizontal Video Center (VR601) to where the displayed picture is center of the background raster in horizontal. (Leave even space at left and right between each side of the background.) (3) After Horizontal Video Center Adjustment, set Brightness (or Sub-brightness) to where the background raster disappears.
2.2	Horizontal Linearity		H. LIN Coil (L601)	Make width of character "H" at left, center and right even. Remarks: Horizontal width also change with this adjustment.
2.3	Horizontal Width	92±5 mm	WIDTH Coil (L602)	Obtain the specified value.
2.4	Vertical Sync		V-HOLD VR (VR501)	Center of hold range.
2.5	Vertical Linearity		V-LIN VR (VR503)	(1) Adjust Vertical Height to obtain 2/3 to 3/4 of the specified value.
2.6	Height	70±5 mm	HEIGHT VR (VR502)	(2) Adjust V-LIN to obtain equal height of character "H" at top and bottom. (3) Adjust HEIGHT VR to obtain specified value.
2.7	Contrast		CONTRAST VR (VR201)	Optimum point, but do not saturate character "H". (If equipped with.)
2.8	Brightness		SUB-BRIGHT VR (VR651)	(1) Set External Brightness VR (if equipped with) to maximum. (2) Set Sub-bright VR to where background raster disappears.
2.9	Focus		FOCUS VR (VR652)	Adjust Focus VR to obtain overall focus. Remarks; Make sure Brightness has been adjusted.
2.10	Centering		CENTERING Magnets	(1) Place display area in the middle of the CRT. (Leave even space at top and bottom, left and right between each side and edge of the CRT.) (2) Correct picture slant with DY by loosing the screw securing the DY.

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FUNCTIONAL PRINCIPLE

6. Functional Principle

6-1. Video Amplifier

Video Amplifier consists of Q201, Q202, and its associated circuitry. A positive pulse is amplified and inverted by both transistors Q201 and Q202, and then injected to the cathode of CRT through R901. C201 compensates the high frequency of Video Amplifier, and VR651 controls the screen brightness of CRT. D654 and C653 are used as a spot killer when DC power source is cut off.

6-2. Vertical Circuit

The synchronous negative pulse inverted by Q501 through R501, C514 and R512 of differentiator circuit is injected to Pin 5 of IC501. The vertical free running frequency is determined by R504, R505, C503 and VR601. It is directly synchronized by the above pulse. As a result of the above opration, the rectangular pulse is generated at Pin 4 and is integrated to the sawtooth waveform by R506 and C505, and injected to Pin 7 through R607, VR502, and C504. Vertical linearity and height are respectively controlled by VR503 and VR502. The output at Pin 1 is loaded to L901 (Deflection Yoke) through C512. Q901 functions as ripple filter for the vertical circuit.

6-3. Horizontal Circuit

The base circuit of Q601 includes a clamp and a differentiator which makes Q601 output insensitive to drive pulse amplitude and width changes. The only requirement is that pulse amplitude be of 2.5 volts minimum and pulse width should be 10-40us. Q601 together with Q602 functions as a monostable multivibrator with Q603 being a slave that provides a positive feedback. Specifically, when Q601 is turned on by the drive pulse, it discharges C603 at a rate determined by the setting of VR601. When C603 is discharged to 2.75 volts, Q602 turns off. This change of state turns Q603 on and the base drive to Q602 from R606 is shunted thru Q603. Q602/Q603 remains in this state for nominally 25us until C603 recharges through A103 to 4 volts. At this time, Q602 is biased on again by the current through VR601. The multivibrator is now in a state that Q602 is on and Q601/Q603 is off. It will ramain in this state until the next drive pulse occurs or power is turned off. C603 is the only timing capacitor in the circuit and has two time constants associated with it. Primarily, the charge path between pin 1 and pin 3 of VR601 determines the on time of Q603 while the discharge path through the video centering control and Q601 determined the delay between application of the drive pulse and start of retrace (turn on of Q603).

6-4. High Level Stages

The output of Q603 is driven to the base of Q604 through T601. The horizontal output circuit consists of Q604, D604, L901, T602 and its associated circuitry. Q604 operates as a switch when affected by the driving pulse and supplies the sawtooth current to L901. D604 is a damper diode. C617, C605 and C606 are called resonance capacitors. The output pulse of T602 is rectified by D653, D652 and D651 for CRT G2, video amplifier, and brightness circuits respectively. L602 and L601 control the width and horizontal linearity.

7. TROUBLESHOOTING

Plug in an edge input connector.

- No Raster appears.
  - Line voltage drops. → Check B+ lines of the horizontal output.
  - Normal line voltage. → Check horizontal, CRT, and video circuits.
    - Only one horizontal raster line → Check for defects in Q701, vertical circuit, and deflection yoke for breaks or short in the wire.
    - Only one vertical raster line → Check for defects in horizontal output circuit and deflection yoke for breaks or short in the wire.
- Raster appears.
  - Insufficient horizontal width → Check horizontal circuits.
  - Unusual vertical size → Readjust VR502 and VR503, or check Q701 and vertical circuit.
  - Dark screen → Readjust VR651 or check CRT's associated circuitry.
  - Vertical hold is not synchronized. → Check vertical circuit.
  - No picture → Check video circuit.
  - Picture appears.
    - Dot brightness is different horizontally and vertically. → Check video circuit.
    - Out of focus → Check CRT and VR652.
    - Picture appears intermittently. → Check for insufficient soldering in video and horizontal circuits.
    - Incorrect horizontal centering. → Readjust VR601.

8. HOW TO REPAIR

8-1. No Raster (1)

No Raster appears.

↓

Does the raster appear at maximum brightness ? ——YES——→ Readjust brightness.

↓ NO

Are there any troubles on B+ line and horizontal circuit ?

↓ NO

Is B+ applied to pin 7 of 10 pin-card connector ? ——NO——→ Check the card connector.

↓ YES

Is rectangular waveform applied to the collector of Q603 ? ——NO——→

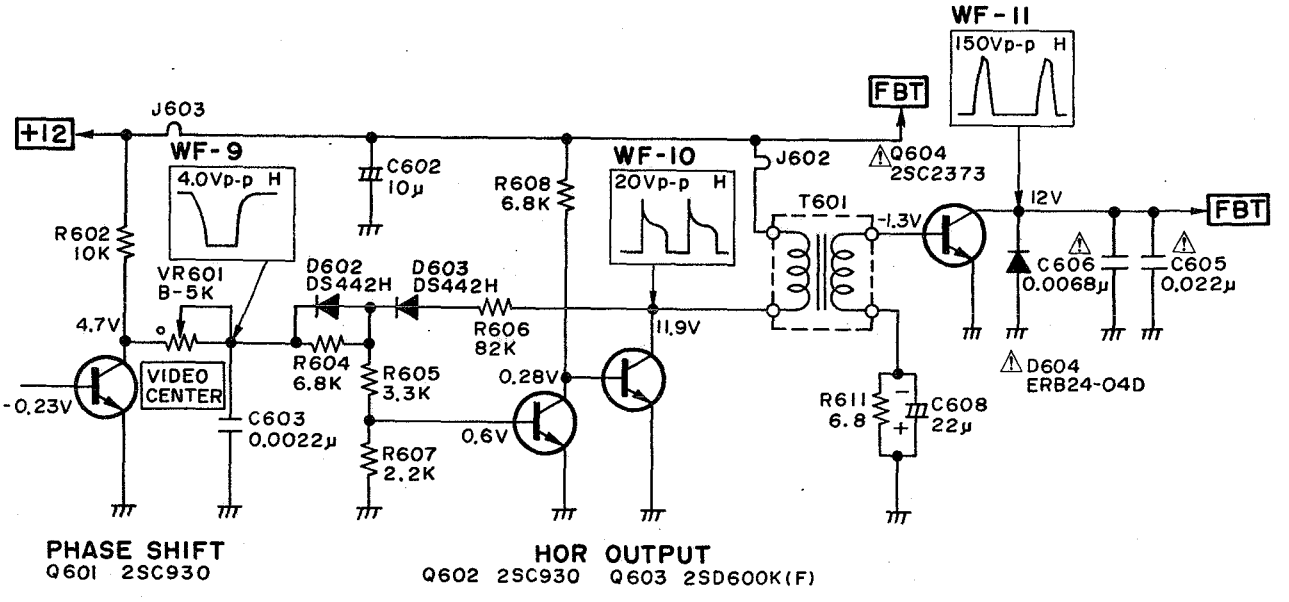
↓ YES

Is power output of horizontal drive circuit applied to the Base of Q604 ? ——NO——→ Check horizontal phase shift circuit Q601. WF-9

↓ YES

Check horizontal output circuit Q604. WF-11

Check horizontal drive circuit Q603. WF-10



DO NOT SCALE THIS DRAWING.

	SCALE	TITLE: HOW TO REPAIR	FILE CODE: WM9448
	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 17/32
REVISION	CHECKED	SANYO TOKYO SANYO ELECTRIC CO.,LTD. ELECTRONICS DIVISION	

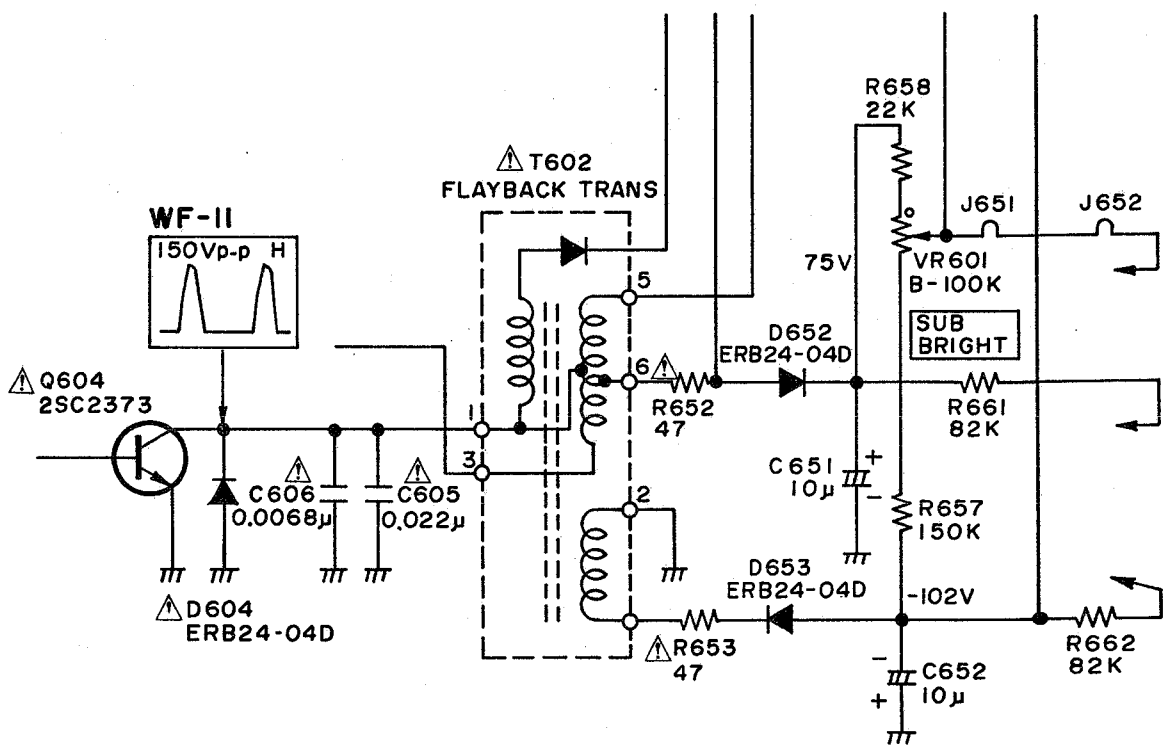
8-2. No Raster (2)

No Raster appears. (In the case of faulty high voltage and CRT circuits)

Is high voltage applied to the anode of CRT ?

- NO → Are pulses applied to the collector of horizontal output Q604 ? : WF-11
  - NO → Check horizontal output circuit.
  - YES → Check flyback transformer.
- YES → Is normal heating voltage applied to CRT's Pin-3 and Pin-4 ?
  - NO → Check heating circuit.
  - YES → Is normal grid voltage (Eg2) applied to CRT's Pin-6 ?
    - NO → Check Eg2 circuit.
    - YES → Is normal cathode voltage applied to CRT's Pin-2 ?
      - NO → Check video circuit.
      - YES → Check CRT.

Note: Check high voltage by approaching the oscilloscope probe, or measure it with a high voltage meter, as high voltage is not able to be measured by a tester.



DO NOT SCALE THIS DRAWING.

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	DRAWN	MODEL	PAGE of PAGES
		DC6005NL/DC6105NL	18/32
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8-3. Only One Horizontal Raster Line

Only one horizontal raster line apprars.

↓

Troubles in vertical deflection circuit

↓

Is output voltage applied to DY's terminals (WD4) ? : WF-7

↓ NO

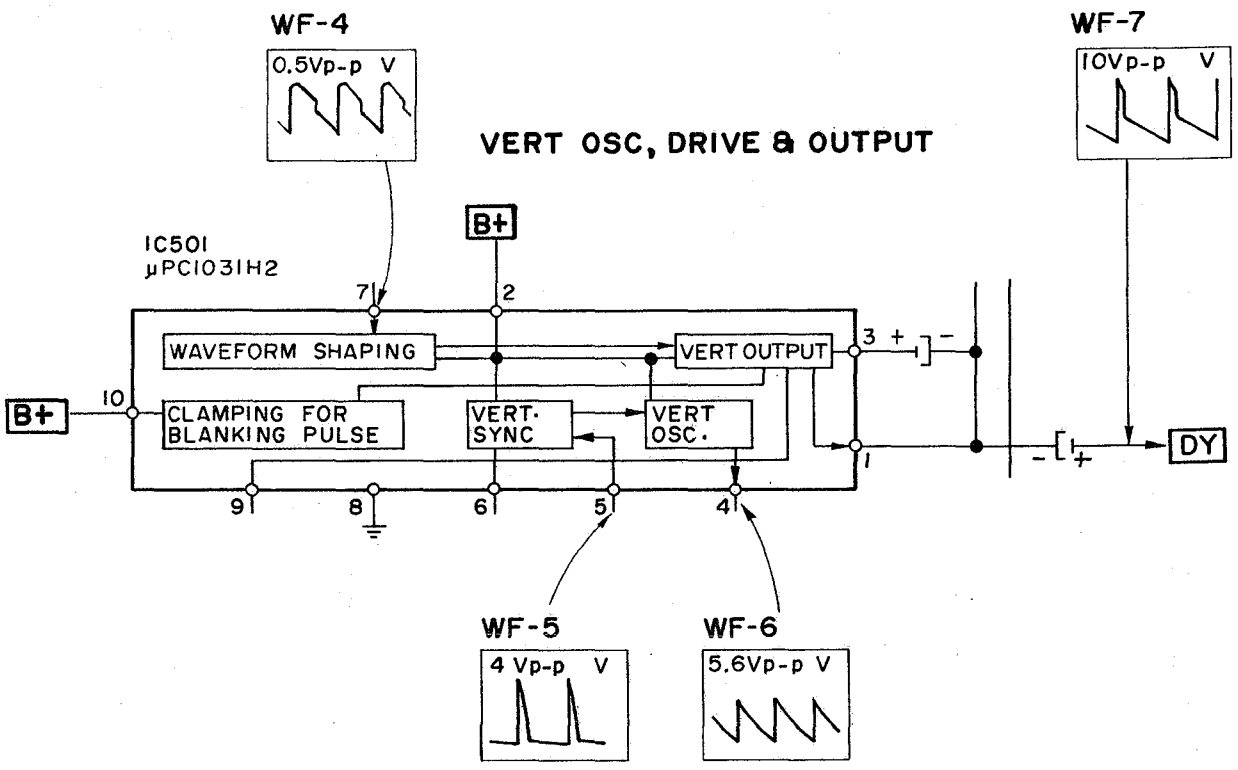
Is output applied to Pin-1 of IC ? ——— YES ——→ Check DY leads and defective connectors.

↓ NO

Is B+ applied to Pin-2 and Pin-10 of IC ? ——— NO ——→ Check B+ line.

↓ YES

Check IC and its associated circuits : WF-4,5 and 6



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	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 19/32
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8-4. Vertical Synchronizing Trouble

Vertical hold is not synchronized.

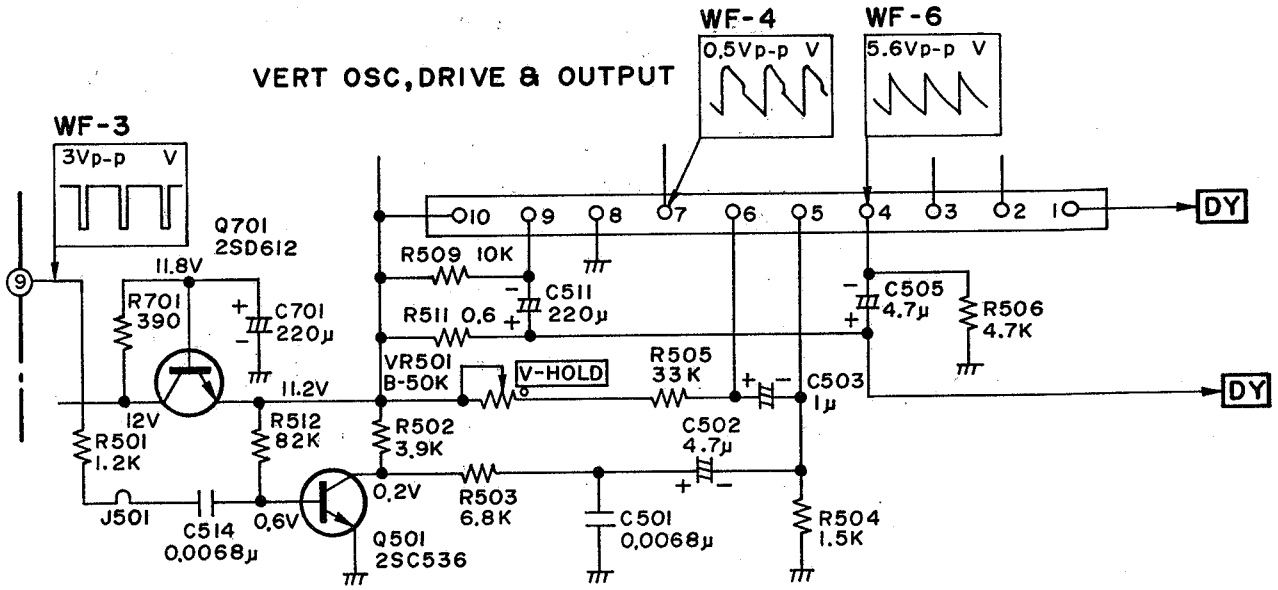
↓

Are the positive vertical synchronous pulses applied to WF-3 ? ——NO——→ Check defective connectors of deflection yoke.

↓ YES

↓

Check VR501.



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	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 20/32
REVISION	CHECKED	SANYO TOKYO SANYO ELECTRIC CO.,LTD. ELECTRONICS DIVISION	

8-5. Improper Vertical Size

Improper vertical size

↓

Is normal DC voltage applied to the emitter of Q701 ? ——— NO ——→ Check Q701.

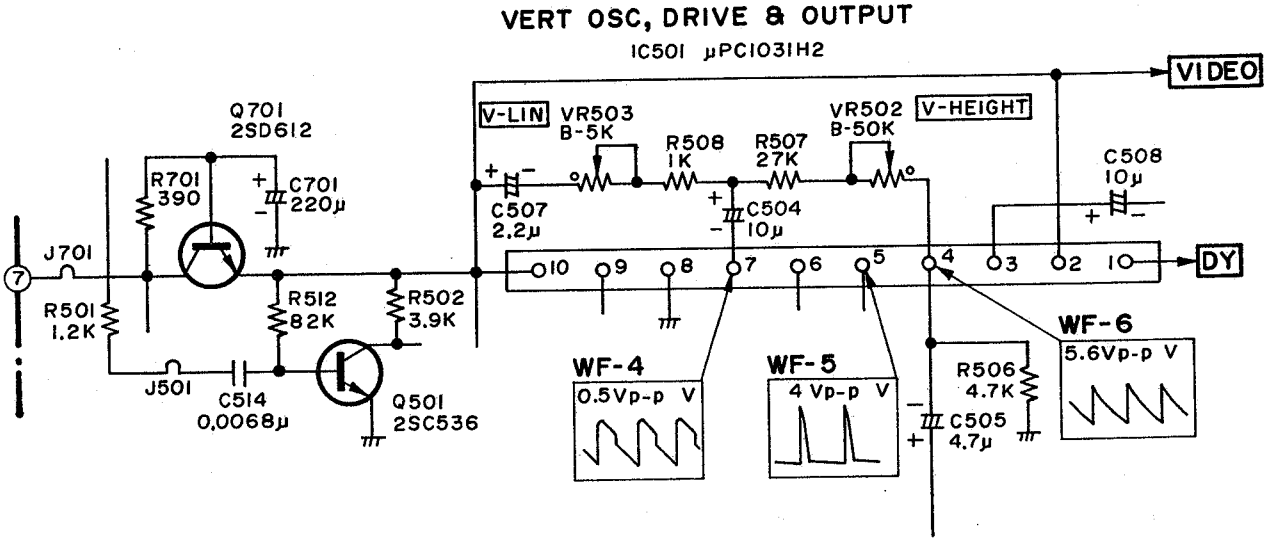
↓ YES

↓ NO

Check VR502 and VR503

↓

Check IC and its associated circuits : WF-4, 5 and 6



DO NOT SCALE THIS DRAWING.

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	DRAWN	MODEL	PAGE of PAGES
		DC6005NL/DC6105NL	21/32
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8-6. No Picture

No picture appears.

↓

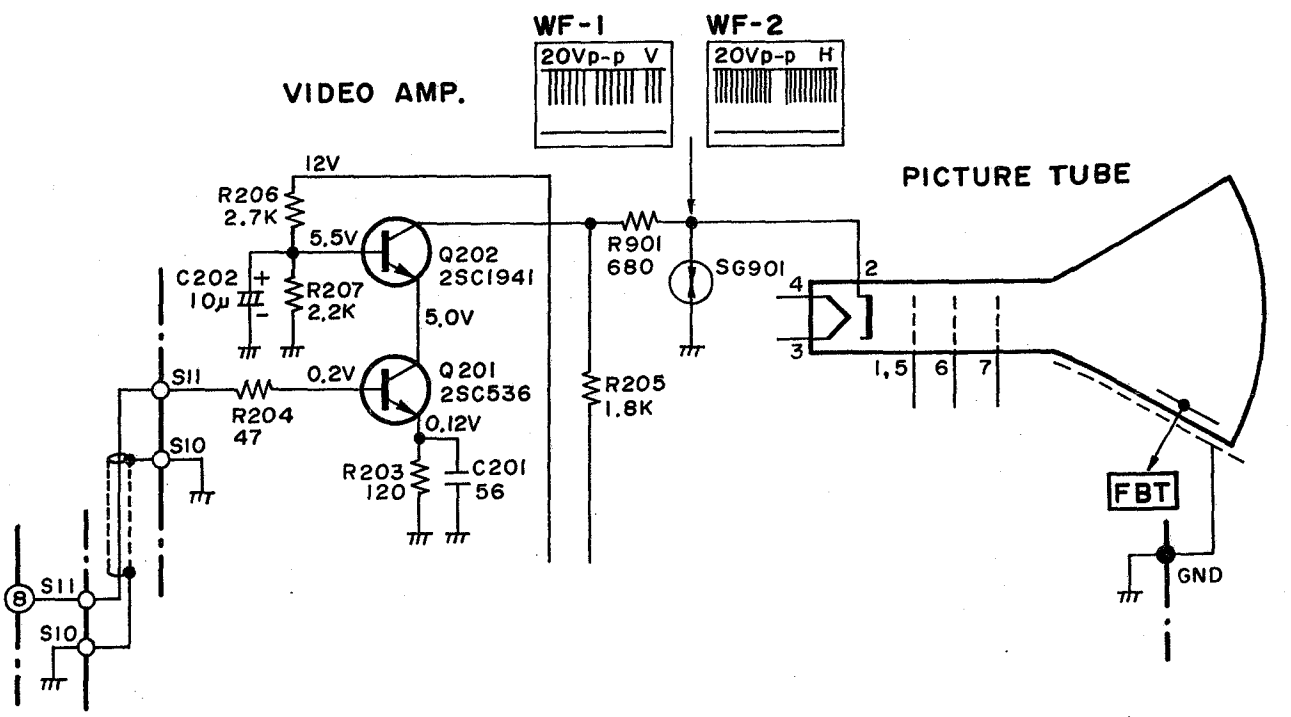
Does raster appear when brightness control is at maximum position ? ——NO——→ Refer to the troubleshooting "No Raster appears".

↓ YES

Are input signals completely supplied ? ——NO——→ Check the signal source.

↓ YES

Check video circuit : WF-1.



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	DRAWN	MODEL	PAGE of PAGES
		DC6005NL/DC6105NL	22/32
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8-7. Out of Focus

Out of focus

↓

Is normal heating voltage applied to the cathode of CRT ? ——— NO ———→ Check R902.

↓ YES

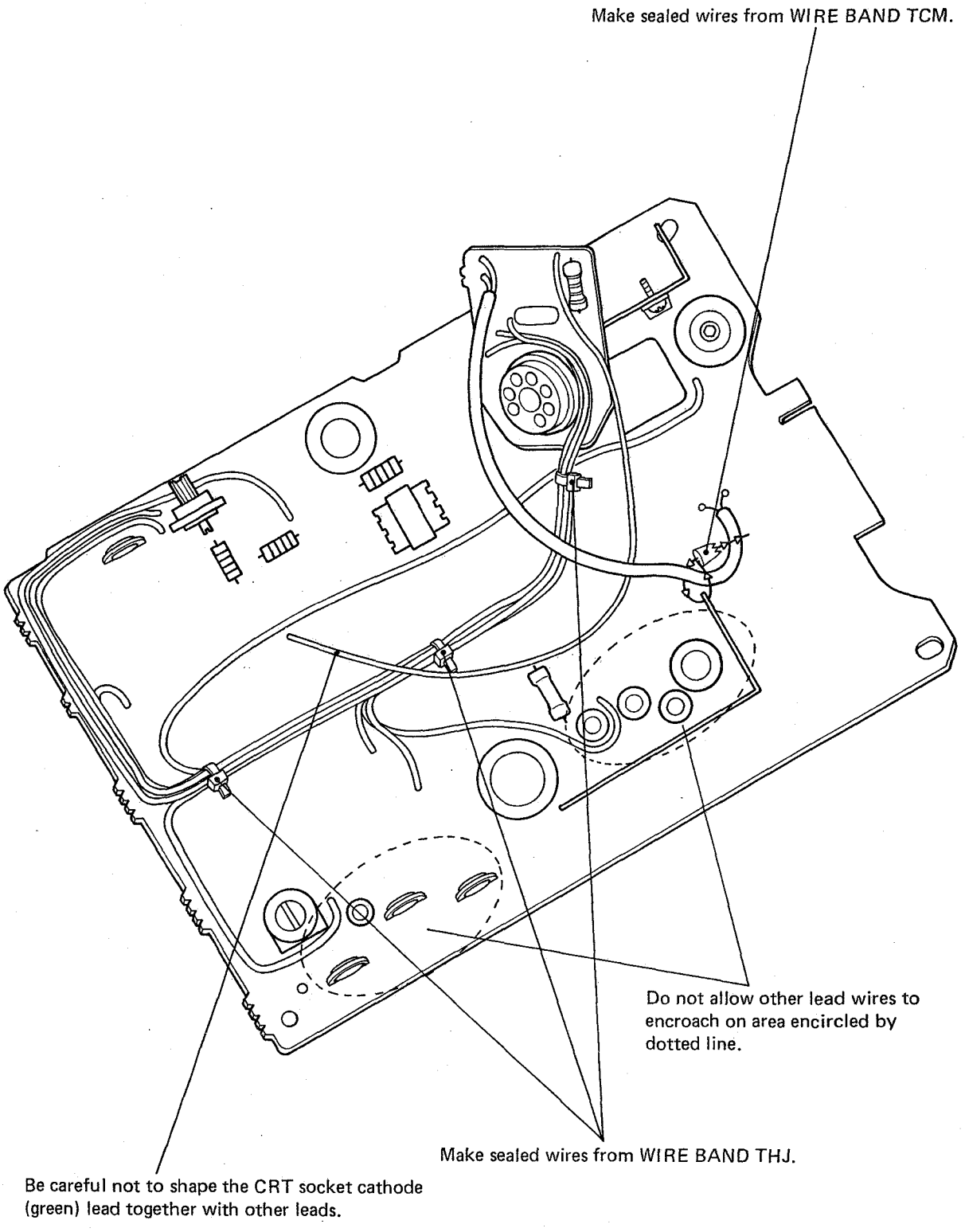
Is normal video signal injected ——— NO ———→ Check EXT. Control VR.
to Pin-8 of edge connector ?

↓ YES

Adjust VR652 for optimum focus.

CAUTIONS TO OBSERVE DURING SET-UP

9-1 Configuration Of Lead Wires


Make sealed wires from WIRE BAND TCM.
Do not allow other lead wires to encroach on area encircled by dotted line.
Make sealed wires from WIRE BAND THJ.
Be careful not to shape the CRT socket cathode (green) lead together with other leads.

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	SCALE	TITLE: CAUTION TO OBSERVE DURING SET-UP	FILE CODE: WM9448
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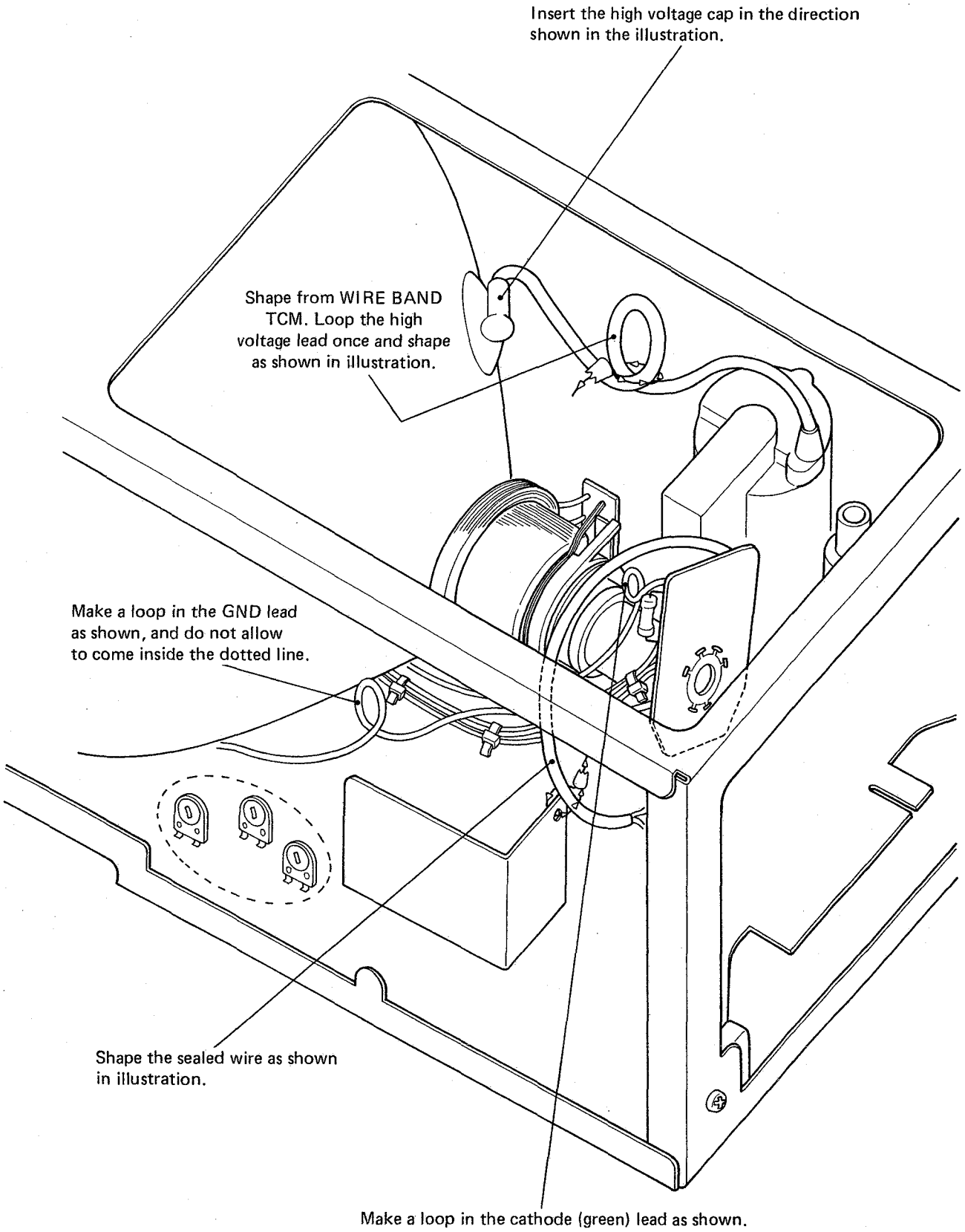
Insert the high voltage cap in the direction shown in the illustration.
Shape from WIRE BAND TCM. Loop the high voltage lead once and shape as shown in illustration.
Make a loop in the GND lead as shown, and do not allow to come inside the dotted line.
Shape the sealed wire as shown in illustration.
Make a loop in the cathode (green) lead as shown.

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	SCALE	TITLE	FILE CODE
		CAUTION TO OBSERVE DURING SET-UP	WM9448
	DRAWN	MODEL	PAGE of PAGES
		DC6005NL/DC6105NL	25/32
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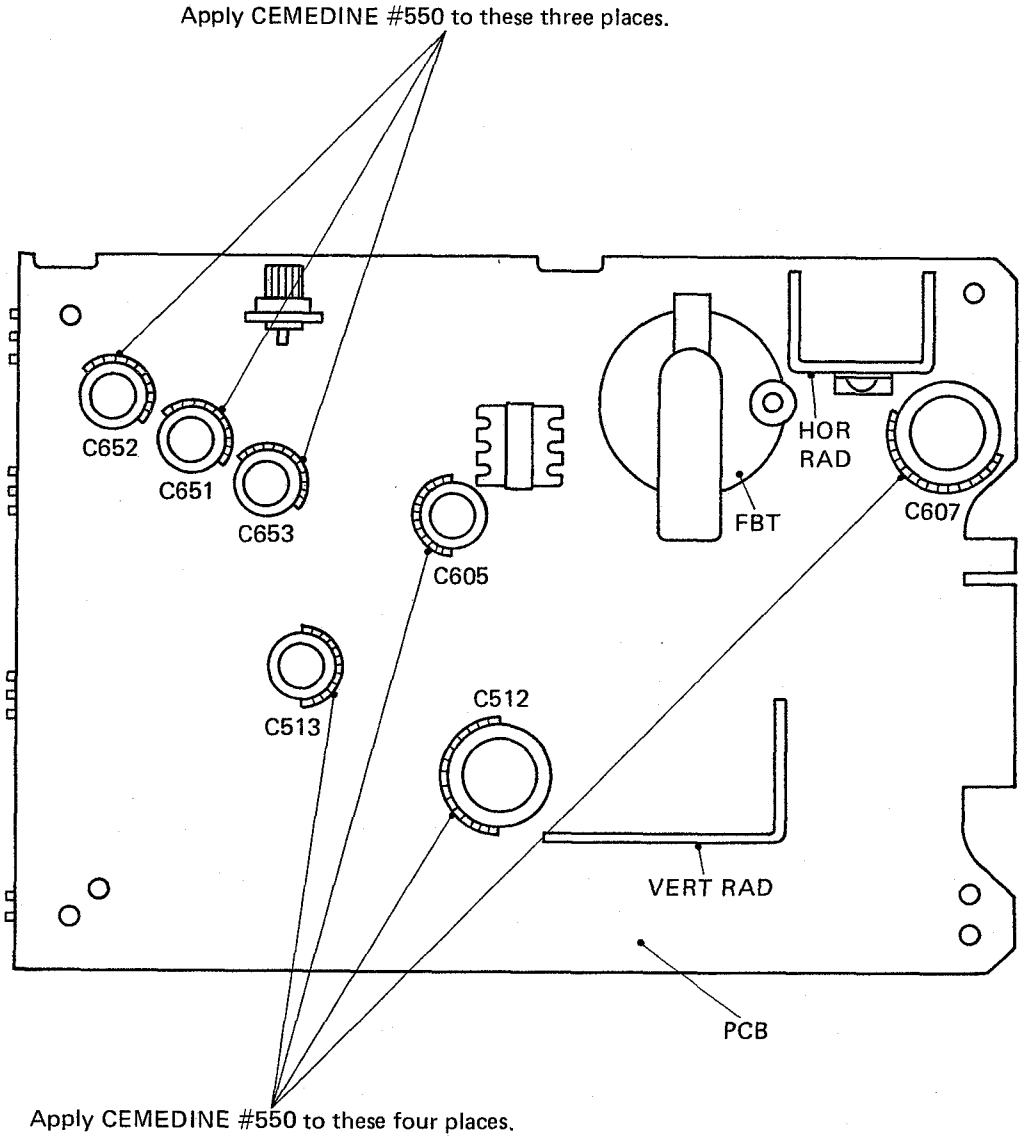
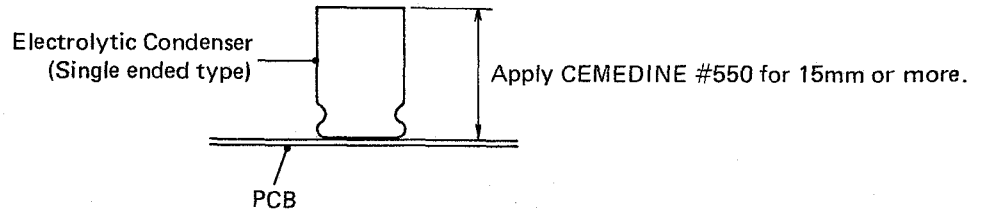
9-2 Where to apply cemedine.



NOTE: When replacing electrolytic condenser (Single ended type), apply CEMEDINE #550 for 15mm or more to the condenser height above the base plate.



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	SCALE	TITLE: CAUTION TO OBSERVE DURING SET-UP	FILE CODE: WM9448
	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 26/32
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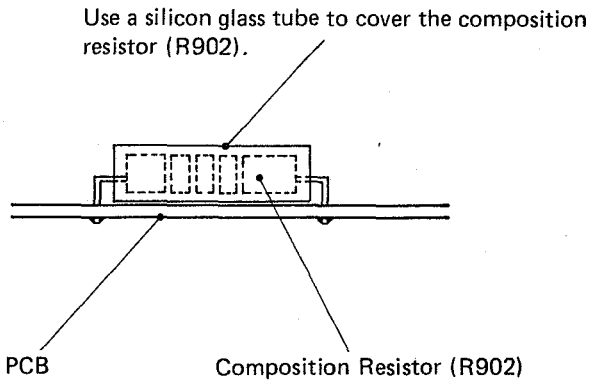
9-3 Where to use a silicon glass tube.



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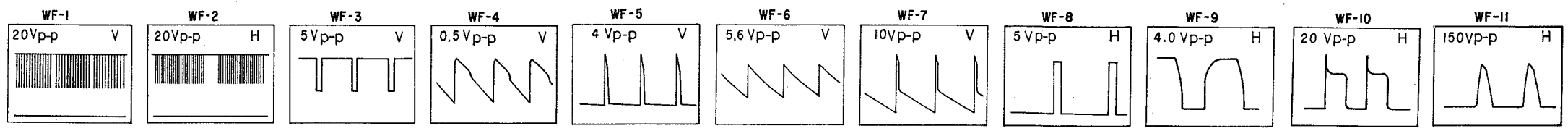
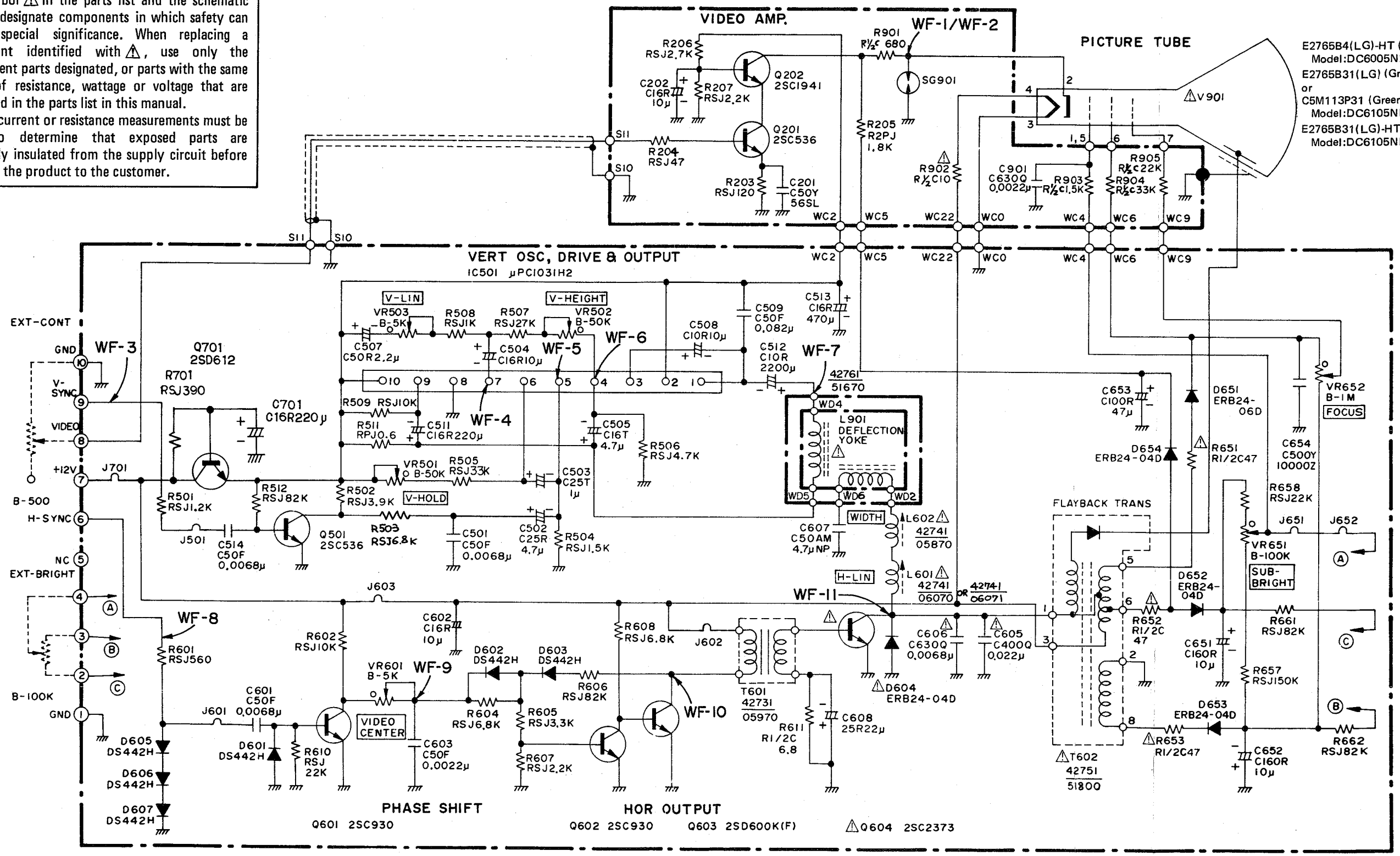
	SCALE	TITLE: CAUTION TO OBSERVE DURING SET-UP	FILE CODE: WM9448
	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 27/32
REVISION	CHECKED	SANYO TOKYO SANYO ELECTRIC CO.,LTD. ELECTRONICS DIVISION	

SCHEMATIC DIAGRAM

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

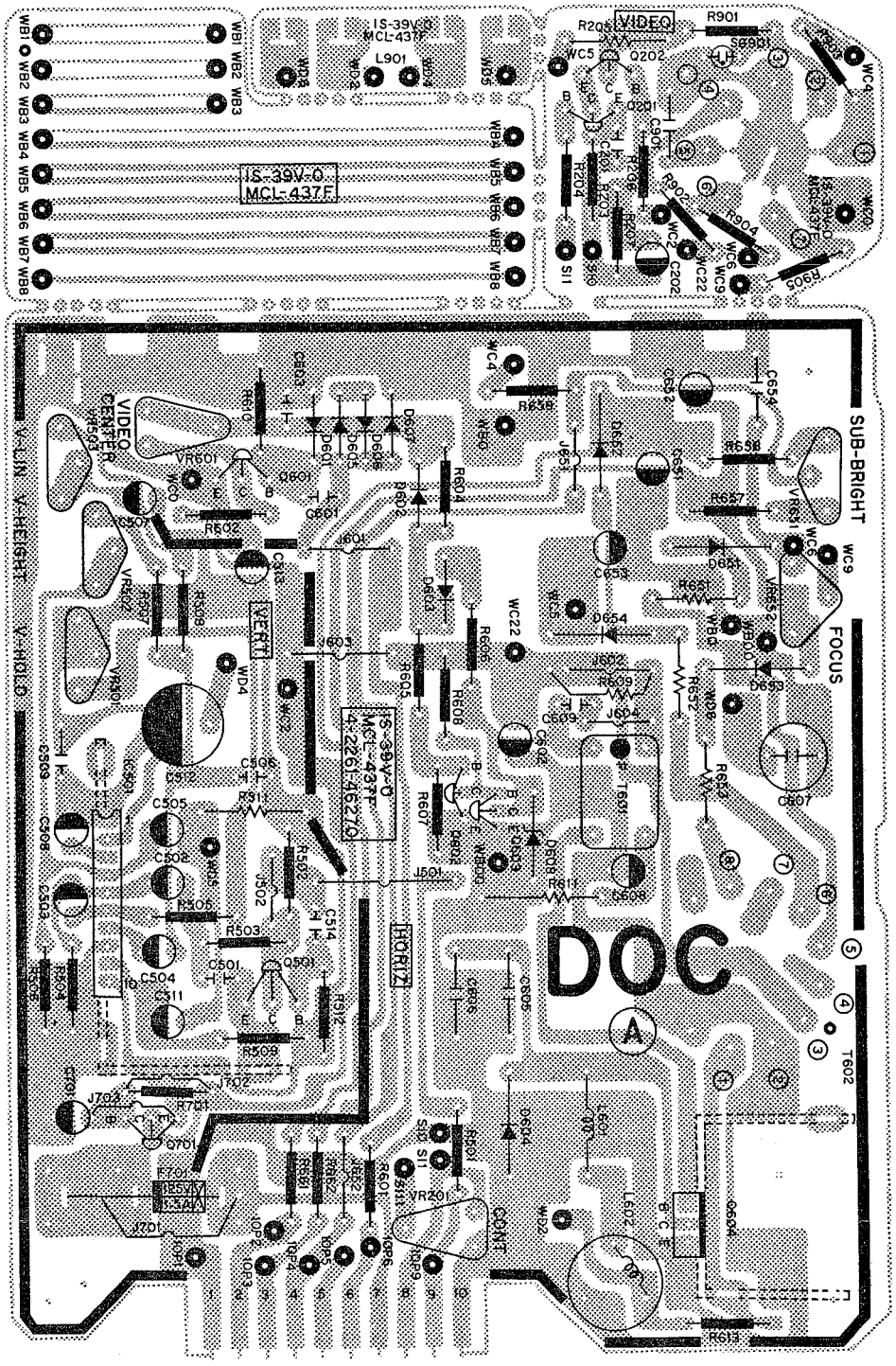




DO NOT SCALE THIS DRAWING.

NOTES:
1. All resistance values in ohm. K=1,000 M=1,000,000
2. Unless otherwise noted in schematic diagram, all capacitors less than 1 are expressed in mfd (μF) and the values larger than 1 are in pF.
3. Voltage reading taken with High Impedance Voltmeter from point indicated chassis ground, contrast at max., other controls at normal, local linevoltage (or specified DC 12V). Voltage reading may vary ±20%.
4. This is a fundamental circuit diagram. Some production changes may be made without revision of the diagram.
5. ⚠: SAFETY use only equivalent replacement parts.

REVISION	SCALE	TITLE: SCHEMATIC DIAGRAM	FILE CODE: WM9448
	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 28/32
	CHECKED	SANYO TOKYO SANYO ELECTRIC CO.,LTD ELECTRONICS DIVISION	



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	SCALE	TITLE: CIRCUIT BOARD DIAGRAM	FILE CODE: WM9448
	DRAWN	MODEL: DC6005NL/DC6105NL	PAGE of PAGES: 29/32
REVISION	CHECKED	SANYO TOKYO SANYO ELECTRIC CO.,LTD. ELECTRONICS DIVISION	

PARTS LIST

PRODUCT SAFETY NOTICE

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Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

NOTES: 1. Parts orders must contain Model Number, Parts Number and Description.
2. Ordering quantity of resistors, capacitors and screws must be multiple of 10 pcs.

Schematic Location	Parts No.	Description	Q'ty
CHASSIS PARTS			
	111 2 3121 19870	CHASSIS FRAME-MDK	1
	111 2 3441 17070	CRT MTG BRKT-MDK	1
	111 2 6211 22770	VERT RAD PLATE-TJJ	1
	111 2 6211 23370	AUDIO RAD PLATE-TMB	1
	111 2 6231 16570	GROUNDING TIP-MDK	1
	111 2 7211 13270	WIRE BAND-TCM	2
	111 2 7211 14870	WIRE BAND-THJ-B	3
ACCESSORIES & LABELS			
	111 6 4551 16970	SERIAL NO LABEL	1
	111 6 4761 36170	SPEC LABEL-MDK	1
	111 6 4761 35971	HOR RATE LABEL-MBN	1
	111 6 4761 35971	HOR RATE LABEL-MBN	1
	111 6 4761 35971	HOR RATE LABEL-MBN	2
	111 6 4791 12154	MDL NO. LABEL-MDK	1
	111 6 4791 12154	MDL NO. LABEL-MDK	4
	111 6 4791 13376	CRT IND LABEL-G	4
	111 6 4791 13376	CRT IND LABEL-G	4
SCREW–CHASSIS			
	102 3 2203 00601	SBRT2, 3.0x6, Z1	2
	102 3 2203 00802	SBRT2, 3.0x8, Z1	6
	111 2 4211 15770	COMB TAP SCREW-MBN	4
ELECTRICAL PARTS			
⚠ L601	4 2741 06070	LINEARITY COIL	1
⚠ or	4 2741 06071	LINEARITY COIL	1
⚠ L602	4 2741 05870	WIDTH COIL	1
⚠ L901	4 2761 51670	DEFLECTION YOKE	1
T601	4 2731 05970	HOR DRIVE TRANS	1
⚠ T602	4 2751 51800	FLYBACK TRANS	1
SMALL PARTS			
	4 2261 46270	PC BOARD DOC	1
	4 2350 61600	TERMINAL SOCKET	1
	4 2351 05470	CRT SOCKET	1
	4 2361 05570	GT PIN	1
SG901	4 2341 06270	SPARK GAP	1
or	4 2341 07770	SPARK GAP	1

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	SCALE	TITLE PARTS LIST	FILE CODE WM9448
	DRAWN	MODEL DC6005NL/DC6105NL	PAGE of PAGES 30/32
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PARTS LIST

Schematic Location	Parts No.	Description				Q'ty
VARIABLE RESISTORS						
VR501	4 2221 24270	10FFRB-50K				1
VR502	4 2221 24270	10FFRB-50K				1
VR503	4 2221 23970	10FFRB-5K				1
VR601	4 2221 33870	9CVFR9B-5K				1
VR651	4 2221 24370	10FFRB-100K				1
VR652	4 2221 35070	15CHFR7B-1M				1
CAPACITORS						
C201	C1HCDK560SL-	CERAMIC	56P	SL	50V	1
C202	C1CRE-106A--	ELECT	10M		16V	1
C501	C1HFRK682A--	MYLAR	0.0068M		50V	1
C502	C1ERE-475A--	ELECT	4.7M		25V	1
C503	C1ETDM105A--	TANTAL	1M		25V	1
or	C1EUEM105A--	ELECT	1M		25V	1
C504	C1CRE-106A--	ELECT	10M		16V	1
C505	C1CTDM475A--	TANTAL	4.7M		16V	1
or	C1CUEM475A--	ELECT	4.7M		16V	1
C507	C1HRE-225A--	ELECT	2.2M		50V	1
C508	C1CRE-106A--	ELECT	10M		16V	1
C509	C1HFRK823A--	MYLAR	0.082M		50V	1
C511	C1CRE-227A--	ELECT	220M		16V	1
C512	C1ARE-228A--	ELECT	2200M		10V	1
C513	C1CRE-477A--	ELECT	470M		16V	1
C514	C1HFRK682A--	MYLAR	0.0068M		50V	1
C601	C1HFRK682A--	MYLAR	0.0068M		50V	1
C602	C1CRE-477A--	ELECT	470M		16V	1
C603	C1HFRK222A--	MYLAR	0.0022M		50V	1
⚠ C605	C2GQRK223A--	POLYPR	0.022M		400V	1
⚠ C606	C2JQRK682A--	POLYPR	0.0068M		630V	1
C607	C1HAEM009T--	ELECT	4.7M		50V	1
C608	C1ERE-226A--	ELECT	22M		25V	1
C651	C2CRE-106A--	ELECT	10M		160V	1
C652	C2CRE-106A--	ELECT	10M		160V	1
C653	C2ARE-476A--	ELECT	47M		100V	1
C654	C2HYDP103Z--	CERAMIC	0.01M	Z	500V	1
C701	C1CRE-227A--	ELECT	220M		16V	1
C901	C2JQRK222A--	POLYPR	0.0022M		630V	1
FIXED REGISTORS						
R203	R2ESPJ121A	CARBON	120		1/4W J	1
R204	R2ESPJ470A	CARBON	47		1/4W J	1
R205	R3DXPJ182A	OXIDE-M	1.8K		2W J	1
R206	R2ESPJ272A	CARBON	2.7K		1/4W J	1
R207	R2ESPJ222A	CARBON	2.2K		1/4W J	1
R501	R2ESPJ122A	CARBON	1.2K		1/4W J	1
R502	R2ESPJ392A	CARBON	3.9K		1/4W J	1
R503	R2ESPJ682A	CARBON	6.8K		1/4W J	1
R504	R2ESPJ152A	CARBON	1.5K		1/4W J	1
R505	R2ESPJ333A	CARBON	33K		1/4W J	1
R506	R2ESPJ472A	CARBON	4.7k		1/4W J	1
R507	R2ESPJ273A	CARBON	27K		1/4W J	1
R508	R2ESPJ102A	CARBON	1K		1/4W J	1

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	DRAWN	MODEL DC6005NL/DC6105NL	PAGE of PAGES 31/32
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PARTS LIST

Schematic Location	Parts No.	Description				Q'ty
R509	R2ESPJ103A	CARBON	10K	1/4W	J	1
R511	R3APPJ0R6A	OXIDE-M	0.6	1W	J	1
R512	R2ESPJ823A	CARBON	82K	1/4W	J	1
R601	R2ESPJ561A	CARBON	560	1/4W	J	1
R602	R2ESPJ103A	CARBON	10K	1/4W	J	1
R604	R2ESPJ682A	CARBON	6.8K	1/4W	J	1
R605	R2ESPJ332A	CARBON	3.3K	1/4W	J	1
R606	R2ESPJ823A	CARBON	82K	1/4w	J	1
R607	R2ESPJ222A	CARBON	2.2K	1/4W	J	1
R608	R2ESPJ682A	CARBON	6.8K	1/4W	J	1
R610	R2ESPJ223A	CARBON	22K	1/4W	J	1
R611	R2HCPJ6R8A	SOLID	6.8	1/2W	J	1
⚠ R651	R2HCPK470A	SOLID	47	1/2W	K	1
⚠ R652	R2HCPK470A	SOLID	47	1/2W	K	1
⚠ R653	R2HCPK470A	SOLID	47	1/2W	K	1
R657	R2ESPJ154A	CARBON	150K	1/4W	J	1
R658	R2ESPJ223A	CARBON	22K	1/4W	J	1
R659	R2ESPJ153A	CARBON	15K	1/4W	J	1
R661	R2ESPJ823A	CARBON	82K	1/4W	J	1
R662	R2ESPJ823A	CARBON	82K	1/4W	J	1
R701	R2ESPJ391A	CARBON	390	1/4W	J	1
R901	R2HCPK681A	SOLID	680	1/2W	K	1
⚠ R902	R2HCPK100A	SOLID	10	1/2W	K	1
R903	R2HCPK152A	SOLID	1.5K	1/2W	K	1
R904	R2HCPK333A	SOLID	33K	1/2W	K	1
R905	R2HCPK223A	SOLID	22K	1/2W	K	1

TUBES & SEMICONDUCTORS

D601	4 2021 21070	SI DIODE DS442H	1
D602	4 2021 21070	SI DIODE DS442H	1
D603	4 2021 21070	SI DIODE DS442H	1
⚠ D604	4 2021 10270	SI DIODE ERB24-04D	1
D605	4 2021 21070	SI DIODE DS442H	1
D606	4 2021 21070	SI DIODE DS442H	1
D607	4 2021 21070	SI DIODE DS442H	1
D651	4 2021 10470	SI DIODE ERB24-06D	1
D652	4 2021 10270	SI DIODE ERB24-04D	1
D653	4 2021 10270	SI DIODE ERB24-04D	1
D654	4 2021 10270	SI DIODE ERB24-04D	1
IC501	4 2061 08670	IC-UPC1031H2	1
Q201	TG2SC536-----	SI TR 2SC536	1
Q202	TN2SC1941----	SI TR 2SC1941	1
Q501	TG2SC536-----	SI TR 2SC536	1
Q601	TG2SC930-----	SI TR 2SC930NP	1
Q602	TG2SC930-----	SI TR 2SC930NP	1
Q603	TG2SD600K-F--	SI TR 2SD600K	1
⚠ Q604	TN2SC2373---5	SI TR 2SC2373-5	1
Q701	TG2SD612-----	SI TR 2SD612	1
⚠ V901	QTME2765B4LNS	CRT E2765B4(LG)-HT White (DC6005NL)	1
⚠ V901	QTME2765B31LN	CRT E2765B31(LG)-HT Green (DC6105NL)	1
⚠ V901	QTME2765B31LS	CRT E2765B31(LG) Green (DC6105NL)	1
⚠ or	QNMC5M113P31S	CRT C5M113P31 Green	1

DO NOT SCALE THIS DRAWING.

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		PARTS LIST	WM9448
	DRAWN	MODEL	PAGE of PAGES
		DC6005NL/DC6105NL	32/32
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